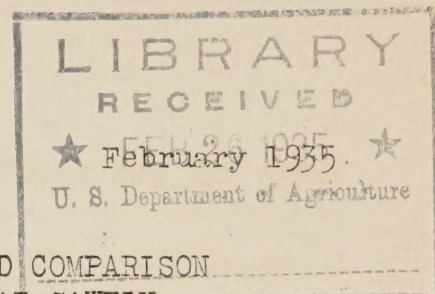


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OUTBREAK OF BLACK GRAIN-STEM SAWFLY IN 1934 AND COMPARISON OF ITS STATUS WITH THAT OF THE EUROPEAN WHEAT SAWFLY

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A heavy infestation of the black grain-stem sawfly, Trachelus tabidus (Fab.), occurred in wheat in the summer of 1934 in western Pennsylvania and eastern Ohio. The areas most seriously damaged included in Pennsylvania the counties of Butler, Westmoreland, and Mercer, and in Ohio the border counties of Trumbull, Mahoning, and Columbiana. Damage was especially intense in Mahoning, Columbiana, and Butler Counties, where most of the wheat fields had noticeable quantities of lodged, or fallen, grain. Many entire fields were leveled, the fallen grain had to be raked, and yields were decidedly reduced by sawfly damage.

In the heavily infested area the injuries were due solely to the species T. tabidus, but farther east in Pennsylvania another species, the European wheat sawfly, Cephus pygmaeus L., was found intermixed, and in some areas only C. pygmaeus was present.

A survey of the infested area consisted in selecting fields at random in the various counties entered and making counts to determine the percentage of straws infested. The distribution of the two species and the areas of infestation observed in 1934, in these and neighboring States, are shown in the accompanying map (fig.1). Table 1 gives by counties the number of fields examined and the average and maximum percentage infestations found.

Table 1.-- Status of infestation of sawflies Trachelus tabidus and Cephus pygmaeus, 1934.

State and county	Species	Number:		
		: of	: Percentage infestation	
		: fields:	Maximum	: Average
Ohio:				
Mahoning	<u>Trachelus tabidus</u>	6	62	38
Columbiana	do.	6	92	29
Trumbull	do.	5	32	19
Stark	do.	3	16	3
Portage	do.	3	8	3
Western Pennsylvania:				
Butler	do.	5	80	28
Westmoreland	do.	5	46	19
Mercer	do.	5	40	16
Indiana	do.	5	24	9

Table 1.- Continued.

State and county	Species	Number: of fields	Percentage infestation Maximum	Average
Central Pennsylvania:				
Armstrong	<u>Trachelus tabidus</u>	5	14	9
Lycoming	<u>Cephus pygmaeus</u>	5	28	11
Northumberland	Both	5	16	7
Montour	do.	5	12	7
Columbia	do.	5	6	4
Union	do.	5	16	10
Snyder	do.	5	24	10
Centre	do.	5	8	4
Southeastern Pennsylvania:				
Lebanon	do.	5	22	10
Berks	<u>Cephus pygmaeus</u>	5	10	6
Chester	do.	4	8	2
Lehigh	do.	5	10	2
Northampton	do.	4	4	3
Bucks	do.	5	4	4
South central Pennsylvania:				
Adams	- - -	5	0	0
Franklin	<u>Trachelus tabidus</u>	5	50	12
Cumberland	do.	5	16	6
Mifflin	<u>Cephus pygmaeus</u>	5	2	1-
Huntingdon	do.	5	6	1
Lancaster	do.	5	14	10
Dauphin	do.	5	10	4
Bedford	- - -	5	0	0
Fulton	- - -	5	0	0
Delaware	- - -	15	0	0
Maryland:				
Baltimore	<u>Trachelus tabidus</u>	5	0	0
Carroll	do.	5	12	4
Howard	do.	5	4	2
Montgomery	do.	5	4	2
Eastern Shore counties as far south as, and including Dorchester	- - -	24	0	0
Northwestern Virginia:				
Shenandoah	do.	5	0	0
Rockingham	do.	5	2	1-
Augusta	do.	5	8	2
Rockbridge	do.	5	0	0
Northern Virginia:				
Loudoun	do.	5	4	1
Prince William	do.	5	0	0
Fauquier	do.	5	4	1

Table 1.- Continued.

State and county	Species	:Number:		
		: of	:Percentage infestation	
		:fields:	Maximum	: Average
Eastern Virginia:				
Caroline	<u>Trachelus tabidus</u>	5	2	1-
Hanover	do.	5	4	1
Essex	do.	5	2	1-
King George	do.	5	0	0
Westmoreland	do.	5	6	2
Richmond	do.	5	0	0
South central Virginia:				
Pittsylvania	do.	5	0	0
Halifax	do.	5	0	0
Campbell	do.	5	2	1-
Southwestern Virginia:				
Washington	do.	5	0	0
Smyth	do.	5	0	0
Wythe	do.	5	0	0

Both species of sawflies were accidentally introduced into this country from Europe a number of years ago and have been slowly invading new territory, becoming a menace to wheat growers.

Trachelus tabidus is of wide distribution, occurring in southern Europe, southeastern Asia, and northern Africa. It is especially known as a wheat pest in southern Russia. It was first observed in America 35 years ago at Riverton, N. J. Investigations started at the Carlisle, Pa., laboratory in 1918 showed it to be well established in Pennsylvania and Maryland. Since then it has been found as far south as Campbell County, Va., as far west as Stark County, Ohio, and as far north as Yates County, N. Y. The infestation in the summer of 1934 was the first of economic importance.

Cephus pygmaeus is considered an important pest of wheat in England, has done much damage in the State of New York, and each year is spreading farther into other wheat-growing areas. It is also liable to be imported into other parts of the country from abroad, as it is "polythermous" and occurs throughout Europe and northern Africa.

The method of attack by these insects causes the wheat stalk to break off near its base, and when the infestation is heavy this results in serious lodging of the heads near harvest time.

The egg is laid in the center of the stem. The young larva feeds within the core of the culm and works its way down toward the base of the plant, where it girdles the stem on the inside, causing it to weaken and finally to break off. The larva then immures itself by plugging the end of the stubble left in the soil, spins a silken cocoon, and hibernates within this shelter. Figure 2, A, shows stubs left by T. tabidus and figure 2, B, those left by C. pygmaeus. It may be observed that C. pygmaeus leaves a much rougher edge on the stubble than does T. tabidus, and this is invariably the case.

In the eastern part of Pennsylvania T. tabidus was found to be considerably parasitized by the chalcidoid Pleurotropis benefica Gahan, but in areas of heavy infestation in western Pennsylvania and Ohio, with the exception of one host observed to be attacked by Eupelmus allynii French, a rather general parasite of insects concealed in stems, no parasitization has yet been found.

The chief parasite of C. pygmaeus in New York State is the braconid Heterospilus cephi Rohwer, but the rate of parasitization by this species has been low during the last few years.

A few other parasites have been found attacking these sawflies, but only to an insignificant extent, probably because the parasites indigenous to this country, with the exception of H. cephi, have not adapted themselves to such newly introduced hosts.

In order to supplement the natural biological control of these pests, arrangements are being made to introduce into this country from Canada the British ichneumonid parasite Collyria calcitrator (Grav.), and it is expected that releases of this species will be made in the areas of heaviest infestation in the spring of 1935. The material is being obtained through the cooperation of the Canadian Department of Agriculture. In England C. calcitrator has been an efficient parasite of Cephus pygmaeus. It is able to exist under various climatic conditions, and is independent of alternate hosts, and these factors are favorable for its effective introduction into the United States.

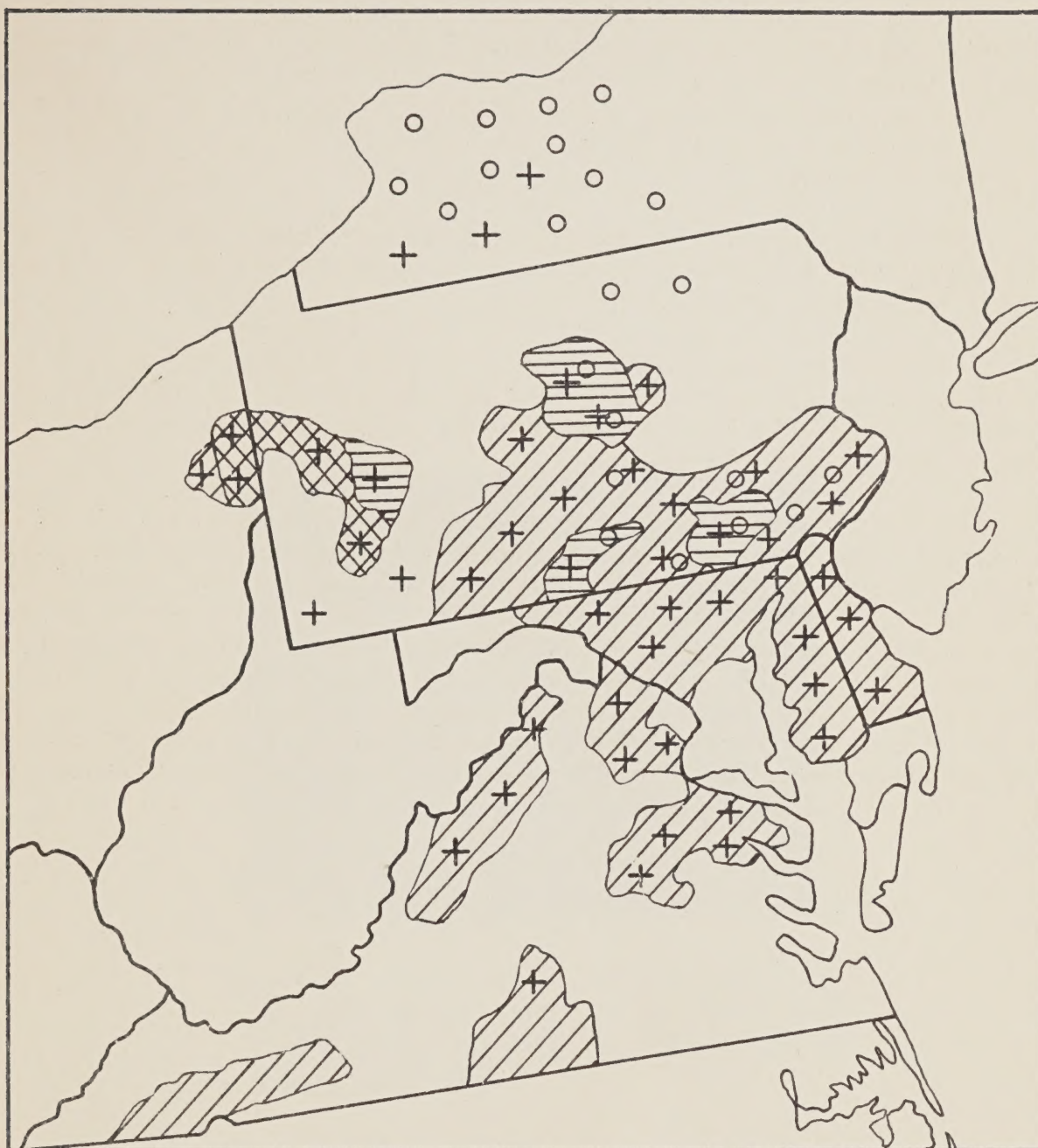
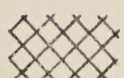
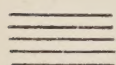


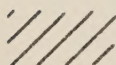
Figure 1--Distribution of two species of sawflies, *Trachelus tabidus* and *Cephus pygmaeus*, 1934. (Only the hatched areas were surveyed.)



Average county infestation ranging from 16 to 38 percent, individual fields as high as 92 percent.



Average county infestation from 6 to 12 percent, individual fields as high as 50 percent.



Average county infestation below 6 percent, individual fields as high as 16 percent.



Distribution of *Trachelus tabidus* Fab.



Distribution of *Cephus pygmaeus* L.

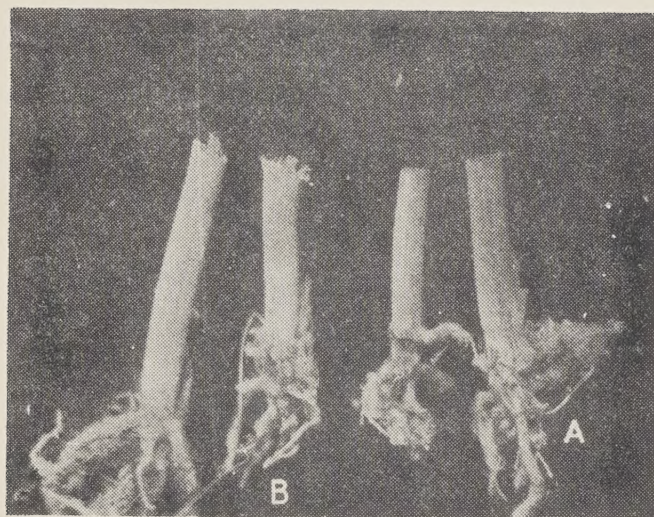


Figure 2.--Wheat stubs left by sawflies for hibernating purpose: A, Stubs left by Trachelus tabidus; B, stubs left by Cephus pygmaeus.

